REMARKS/ARGUMENTS

Claims 6-11 and 33-37 are pending. Claims 6-11 and 33-37 have been rejected.

The §103(a) Rejection (Wallin in view of McArdle):

Claims 6 and 7 have been rejected under 35 U.S.C. §103(a) as being obvious over Wallin U.S. Publ. No. 2001/0038810 in view of McArdle et al., U.S. Publ. No. 2002/0095871 ("McArdle" herein).

The Office Action recognizes that Wallin fails to "disclose talc as one of the precursor compounds used to obtain the disclosed porous mullite." The Office Action cites McArdle et al. motivated by the fact that fillers such as talc affect properties of ceramics such as hardness, porosity level, wear behavior, and more [0053]."

McArdle only describes talc among other ceramics used as a filler [0053] in an abrasive aggregate for use in a grinding wheel (abstract). Filler, by McArdle and by definition, is an inert mineral powder that merely is bound together by a ceramic binder [0040 and 0053]. Thus, if one were to incorporate McArdle into Wallin, it would merely result in intact talc particles being incorporated into, for example, the pores of the porous acicular mullite.

In contrast, the method as now claimed in amended Claim 6 is a method to form a crystalline (mullite) compound porous body by the application of heat and temperature to form a "mullite composition comprised substantially of acicular mullite grains that are essentially chemically bound.", where it is now clear that the property enhancing compound reacts and is incorporated into the grain boundary interface amorphous phase.

It is well established that to support a prima facie case of obviousness each of the elements must be known. See MPEP 2143(A), which states, The rationale to support a conclusion that the claim would have been obvious is that *all the*

claimed elements were known in the prior art and one skilled in the art could have combined the elements as claimed by known methods with no change in their respective functions, and the combination yielded nothing more than predictable results to one of ordinary skill in the art. *KSR*, 550 U.S. at ___, 82 USPQ2d at 1395; *Sakraida v. AG Pro*, Inc., 425 U.S. 273, 282, 189 USPQ 449, 453 (1976); *Anderson's-Black Rock, Inc. v. Pavement Salvage Co.*, 396 U.S. 57, 62-63, 163 USPQ 673, 675 (1969); *Great Atlantic & P. Tea Co. v. Supermarket Equipment Corp.*, 340 U.S. 147, 152, 87 USPQ 303, 306 (1950). (Emphasis added).

The Final Rejection, recognizes that McArdle does nothing more than incorporate talc as a filler to effect properties. The Applicants deem this as being rather spurious indeed, since any foreign material will affect some property or characteristic by its mere presence in another. That is, the mere presence of the talc as talc in a body will modify the properties of the body in some way. (penultimate para., of page 3). Thus, it is clear that combining McArdle with Wallin would merely direct one of ordinary skill in the art to add the talc as talc as a filler to the mullite. This is not what Claim 6 requires.

In contrast, the method of Claim 6 requires making mullite under heat and fluorine sufficient such that an element of the talc (property enhancing compound) is incorporated (reacted) into the mullite's glassy grain boundary phase. Neither McArdle nor Wallin describe the use of talc as a reactant to form a porous mullite body. Since neither of the cited patents describe the use of talc as reactant for making mullite, the Examiner has failed to make a *prima facie* case of obviousness and as such Claim 6 is patentable. For this reason Claim 6 is non-obvious and patentable.

Further, the Examiner, recognizes that the "motivation has been indicated as why to use talc in ceramic mixtures." In a simple mixture, Applicants agree, talc may be used if there is a desirable reason and that reason is more than the mere fact that some unknown property may desired. It also reinforces the fact, that the Examiner has made no reasonable argument as to why talc would be used as a reactant in the method of Claim 6 to form mullite.

Further, it is well settled that to make a case of *prima facie* obviousness requires an explicit reason one of ordinary skill in the art would select the elements of the claim. MPEP 2143(III). It is also well settled that in the chemical

arts, which are unpredictable, "KSR presupposes that the record up to the time of the invention would give some reasons, available within the knowledge of one of skill in the art, to make particular modifications to achieve the claimed compound . . . [and] the record before the time of the invention would supply some reasons for narrowing the prior art universe to a finite number of identified, predictable solutions." *Eisai Co. Ltd v. Dr. Reddy's Laboratories Ltd.*, 533 F.3d 1353, 1359 (Fed. Cir. 2008).

The Examiner has given no reason why one would select talc to reactively form mullite as required in Claim 6. The mere fact that talc has been used in a composition as filler in an abrasive ceramic aggregate of McArdle (Abstract), gives absolutely no motivation to one of ordinary skill to react mullite precursors along with talc to make an improved thermal shock mullite. In other words, merely because a compound has been used as filler, is not a reason to react it and expect anything useful, because is will have chemically changed. For this reason, Claims 6 and 7 are non-obvious.

Finally, Claim 6 and 7 are non-obvious because the applicants have discovered that a more thermal shock resistant porous mullite composition is formed when the mixture that reacts to form the mullite includes talc. That is, the applicants have discovered a result effective variable. The result effective variable, in particular, is the use of talc in the reactive mixture. Neither of the references mentions such a property. The references fail to describe any elements having an impact on thermal shock resistance of a porous mullite composition.

Thus, just as in *In re Antonie*, it is well established that the discovery of a result effective variable for a particular purpose is non-obvious. *In re Antonie*, 559 F.2d 618, 620 (1977 CCPA). Applicants have discovered such a result effective variable (i.e., the use of talc, and not only that, Applicants have also discovered the unexpected effect (improved thermal shock resistance), which was not known). For this additional reason, Claims 6 and 7 are non-obvious.

The §103(a) Rejection (Wallin in view Joy):

Claims 8-11 and 33-37 have been rejected under 35 U.S.C. §103(a) as being obvious over Wallin in view of Joy III, U.S. Pat. No. 4,526,886 (Joy). Applicants disagree.

To reiterated, It is well settled that to make a case of *prima facie* obviousness requires an explicit reason one of ordinary skill in the art would select the elements of the claim. MPEP 2143(III). It is also well settled that in the chemical arts, which are unpredictable, "KSR presupposes that the record up to the time of the invention would give some reasons, available within the knowledge of one of skill in the art, to make particular modifications to achieve the claimed compound . . . [and] the record before the time of the invention would supply some reasons for narrowing the prior art universe to a finite number of identified, predictable solutions." *Eisai Co. Ltd v. Dr. Reddy's Laboratories Ltd.*, 533 F.3d 1353, 1359 (Fed. Cir. 2008).

With regard to Claim 8, The Final Rejection (page 5) recognizes that Wallin fails to disclose any particular combinations as described above and is "silent to a ratio of the first metal . . . to the second metal . . . in said catalyst." The Final Rejection also recognizes that Joy's said catalyst, "comprises platinum and/or palladium and further, 0.01 to 25 wt.% of one or more base metals such as magnesium and neodymium (Abstract, column 1, lines 26-33; column 2, lines 20-50)." The Final Rejection further states,"[i]t should be noted that while Joy III does not expressly disclose a weight ratio of 0.1 to 10 or 0.2 for Nd/Mg, it discloses a range of 0.01 to 25 wt.%, based on the total metal content of each one in the of them being present in the catalyst. . . ." (emphasis added)

Somehow, apparently from Wallin, the Final Rejection selects, for example, the two metals Nd and Mg required in the method Claim 11 and Fe and Mg required in Claim 33, citing merely to Wallin who teaches millions of metal, metal compounds and combinations thereof as catalysts (paragraphs 30-35 and see last sentence of para. 30). (page 5, first full paragraph). No reason, however, as required to make a *prima facie* of obviousness is given by the Examiner. In the absence of any reason for the selection of any combination of elements for any purpose, the Final

Rejection has failed to make *prima facie* case of obviousness and as such independent Claims 8, 11 and 33 and their dependent Claims are nonobvious.

As to the statement relating to Joy III, "said reference is utilized in a 103 obviousness rejection because of [*sic*] this reference provides teachings on the use of Mg and Nd and their amounts in a way that results in a ratio of Nd/Mg which would have overlapping ranges with the ratio instantly claimed." Applicants point out that such a statement is unsupported by Joy. Joy teaches that any base metal may stabilize a Pt or Pd based catalyst, but such metals by themselves (i.e., in the absence of Pt or Pd) may have no effect or suffer from some other problem (sulfur poisoning). (col. 2, lines 24-36). Joy also fails to describe any combination of such base metals. Thus, the use of Joy to indicate a range, much less any reason to select any such metal is unsupported by Joy. In other words, it appears that the Final Rejection relies upon Joy's mere description that a base metal is present in some weight percent in Joy's Pt, Pd and Ur catalyst composition to somehow show that there is a reason to select a particular ratio of metals.

To reiterate, the Final Rejection fails to provide any reason from the art or scientifically to select any combination or ratio of the elements required in Claims 8, 11 and 33. No reason is given for any predictable effect on the catalytic performance or any other effect of such combinations or ratios. That is Joy adds nothing more to Wallin, in that if one accepts the Final Rejection's erroneous premise that somehow Wallin's millions of combinations of catalysts suggest a combination such as Nd/Mg, they would have to be present in some amount. Then what does Joy add? The Final Action has only used Joy to make a conclusory statement that it would be obvious to adjust the ratio of Nd/Mg in the weight range of Joy specified for any one or number of base metals, but has not provided what the reason would be to adjust the ratio in the first place and that there is some predictable effect. Thus, the Final Rejection has failed to make a *prima facie* case of obviousness and as such independent Claims 8, 11 and 33 are non-obvious for this additional reason.

Finally, Claims 8, 11, 33 and their dependent Claims are non-obvious because the applicants have discovered that a more thermal shock resistant porous mullite composition is formed when a method to form mullite utilizes particular combinations of elements and, in the case of Claim 11, a particular ratio of Nd/Mg

and, in the case of Claim 33 a particular ratio of Fe/Mg. That is, the applicants have discovered a result effective variable. The result effective variable is the use of compounds so that particular combinations of elements at particular ratios are used to reactively form a more thermal shock resistant porous mullite composition. Neither of the references mentions such a process to get such an improved property. The references fail to describe in any way a method of forming mullite with such combinations of elements. The references also fail to describe any ratio of any elements having an impact on thermal shock resistance of a reactively formed porous mullite composition.

Thus, just as in *In re Antonie*, it is well established that the discovery of a result effective variable for a particular purpose is non-obvious. *In re Antonie*, 559 F.2d 618, 620 (1977 CCPA). Applicants have discovered such a result effective variable (i.e., particular combinations of elements when making the mullite and ratios of these particular elements), and not only that, Applicants have also discovered the unexpected effect (improved thermal shock resistance), which was not known. For this additional reason, Claims 8, 11, 33 and their dependent Claims are non-obvious.

Considering the foregoing reasons Claims 6-11 and 33-37 are patentable. Applicants, therefore, respectfully request withdrawal of all rejections and allowance of Claims 6-11 and 33-37.

Respectfully submitted,

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